

Improvements relating to the production of thermistors

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Abstract of GB1025106

1,025,106. Thermistors. W. R. GRACE & CO. Oct. 28, 1963 [Dec. 14, 1962], No. 42489/63. Heading H1K. A process for preparing thermistor devices comprises doping a monocrystalline high purity n-type silicon rod with between 1 and 100 parts of gold per 10⁹ of silicon by means of a zone levelling technique. A rod of silicon having an impurity content of less than 100 parts in 10⁹ is placed in a zone-melting apparatus together with an w-type silicon seed crystal (resistivity 10-640 ohm/cm.), a silicon phosphorus dope containing 1-4 x 10⁴ parts of phosphorus per 10⁹ silicon and a quantity of very high purity gold. These materials are then subjected to a zone melting process whereby a monocrystalline rod of silicon having a uniform distribution of gold (preferably 4-20 parts per 10⁹) therein is obtained. The rod is cut into wafers by means of a diamond saw and the resulting wafers are then etched, washed and transferred via an ammonium hydroxide bath to an electrodeless nickel-plating tank. After deposition of the nickel the wafers are heat treated at 210 C. for 18 hours in an argon or nitrogen atmosphere. The wafers are then diced using an ultrasonic saw and tinned copper leads are soldered to each of the dice. The edges of the dice are ground away to remove any surplus metal which may be short-circuiting the electrodes and to adjust the resistance value to be equal to that of a standard thermistor. The devices are finally painted with a white silicone enamel or with vulcanized silicone rubber.

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